UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Agricultural Economics

BUTTER PRODUCTION TRENDS

By E. É. Vial, Senior Agricultural Economist,
Division of Statistical and Historical Research

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Butter Production Trends

In the 64-year period from 1869 to 1932 butter production in the United States increased at the average rate of 2.32 percent per year. In this same period population in the United States increased at the rate of 1.91 percent per year. Butter production increased more rapidly than population, so that per capita production of butter increased at the rate of 0.41 percent per year.

Even though there has been a general upward trend in butter production, there have been marked variations in the rate of increase from decade to decade. In some periods the production of butter has not increased as rapidly as population. Table 1 shows the rates of increase in butter production and in population by 10-year periods.

Table 1.-Annual rates of change in butter production, population growth, and butter production per capita in the United States, 1870-1879 to 1924-1932

Period	Annual rates of change		
	Butter production 1/	Population	Butter production per capita
	Percent	Percent	Percent
1870-1879	+ 7.43	+ 2.68	+ 4.62
1880-1889	+ 4.84	+ 2.31	+ 2.38
1890-1899	+ 4.78	+ 1.91	+ 2.78
1900-1909	+ 1.18	+ 1.96	- .77
1910-1919	- .63	+ 1.45	- 2.04
1920-1929	+ 2.71	+ 1.47	+ 1.28
1924-1932	+ 1.18	+ 1.27	- .09

1/ Total butter including farm and factory.

During the decade 1870 to 1879 butter production increased at the rate of 7.4 percent per year. This was the most rapid rate of increase for any of the 6 decades for which the data are available.

The general trend of butter production was upward during each of the decades from 1870 to 1910. Even though the trend of production was upward the rate of increase declined. Butter production increased, but at a decreasing rate.

In the decade 1910 to 1919 there was a slight downward trend in production. Butter production was low during the war period, even though prices were high. The high prices in the war period did not stimulate production as is often supposed.

In the period 1918 to 1924 there was a rapid increase in production from the low level during the war period, and in the decade of the 1920's the rate of increase was 2.71 percent per year.

In the past 9 years, 1924 to 1932, butter production in the United States increased at the rate of 1.18 percent per year. Except for the period 1910 to 1919 this was as low a rate of increase in butter production as in any decade since the Civil War. The drastic decline in butter prices since 1929 has not been due to any marked change in production.

Figure 1 shows the annual production of butter including both farm and factory production for the period 1849 to 1932. The general trend of production has been upward. Production was relatively low in the period 1891 to 1894 when there were severe droughts, and in the period 1917 to 1921. Following each of these periods of low production there was a rapid increase in production.

Butter Production Per Capita

In the 30-year period 1870 to 1900 butter production increased more rapidly than population, that is per capita production increased. For the 5 years 1869 to 1873 per capita production of butter averaged 12.0 pounds compared with 20.5 pounds for the period 1895 to 1899. It was in the late 90's that per capita production of butter in the United States reached a peak, since then the general trend of per capita production has been downward.

In the last 9 years production of butter per capita has been unusually stable. Per capita production in the 5 years 1928 to 1932 averaged 17.6 pounds exactly the same as in the pre-war period 1910 to 1914. Except for the war period and the years immediately following it, per capita production of butter in the last 5 years has averaged as low as in any 5-year period since the early 90's.

The marked decline in butter prices since 1929 cannot be explained by high production per capita or by any marked change in per capita production.

In the period 1869 to 1912 the United States was a butter exporting country. But in the 64-year period from 1869 to 1932 there were only

Butter Production in the United States, 1849-1932

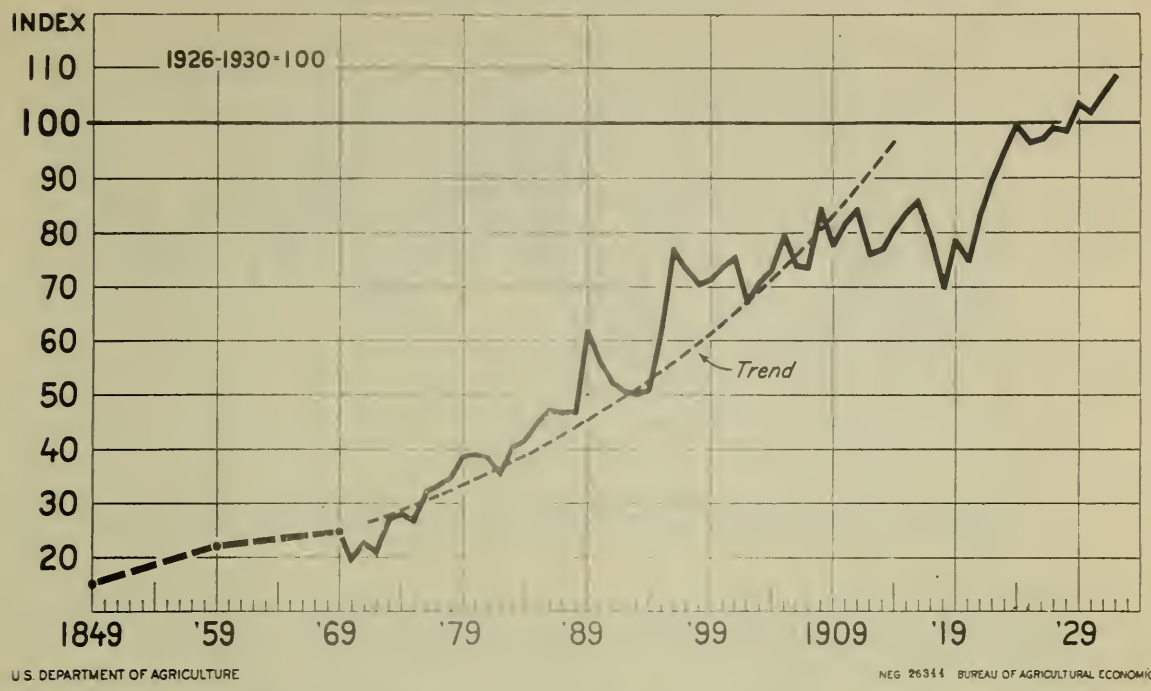

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FIGURE 1 - IN THE PERIOD FROM 1869 TO 1914 BUTTER PRODUCTION IN THE UNITED STATES INCREASED AT THE RATE OF 3.08 PERCENT PER YEAR. [illegible] PRODUCTION AVERAGED 17.6 POUNDS, [illegible] PERIOD 1910 TO 1914.

Butter Production Per Capita in the United States, 1849-1932

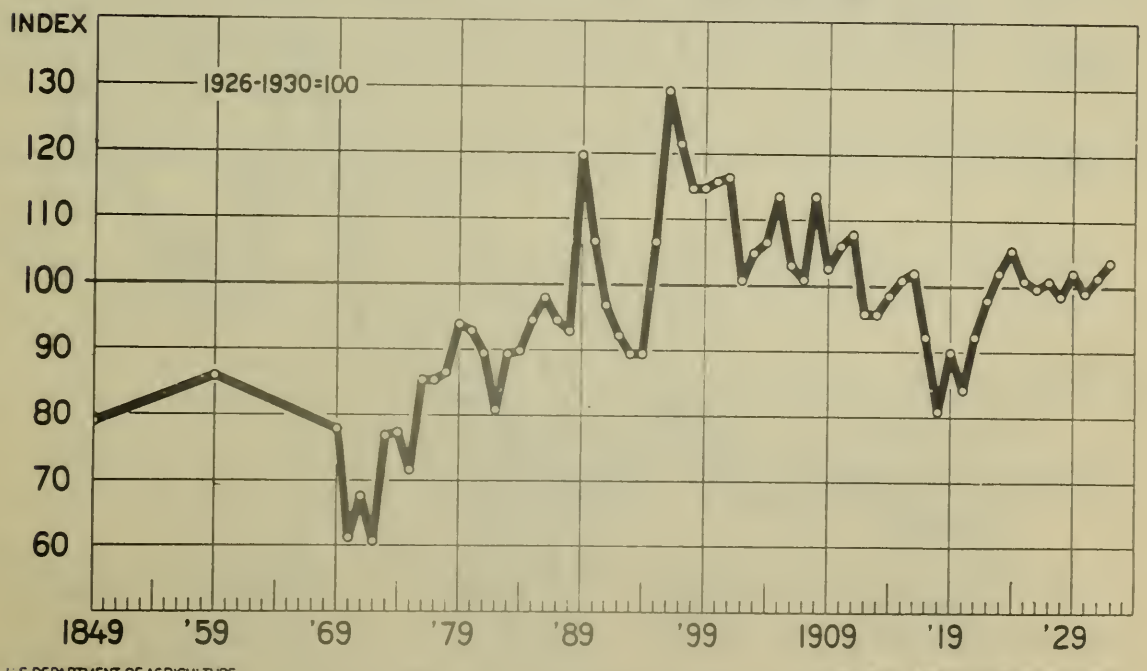

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FIGURE 2 - BUTTER PRODUCTION PER CAPITA REACHED A PEAK IN THE LATE 90's. FROM 1900 TO 1920 PER CAPITA PRODUCTION DECLINED. IN THE FIVE YEAR PERIOD 1928 TO 1932 PER CAPITA PRODUCTION AVERAGED 17.6 POUNDS, THE SAME AS IN THE PRE-WAR PERIOD 1910 TO 1914.

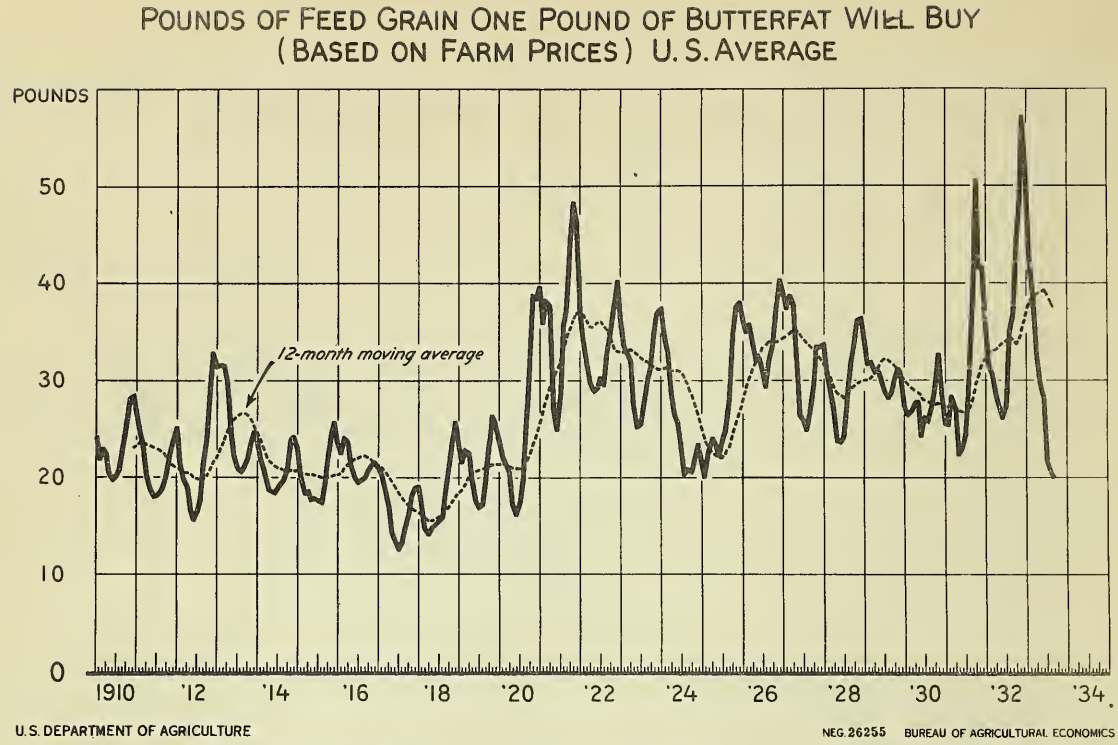

FIGURE 3 - IN THE 10-YEAR PERIOD 1920 TO 1929 THE PRICE OF A POUND OF BUTTERFAT WAS EQUIVALENT TO ABOUT 30 POUNDS OF FEED GRAIN, COMPARED WITH 22 POUNDS IN THE PERIOD 1910 TO 1914. IN 1933 GRAIN PRICES ROSE MORE THAN BUTTERFAT PRICES.

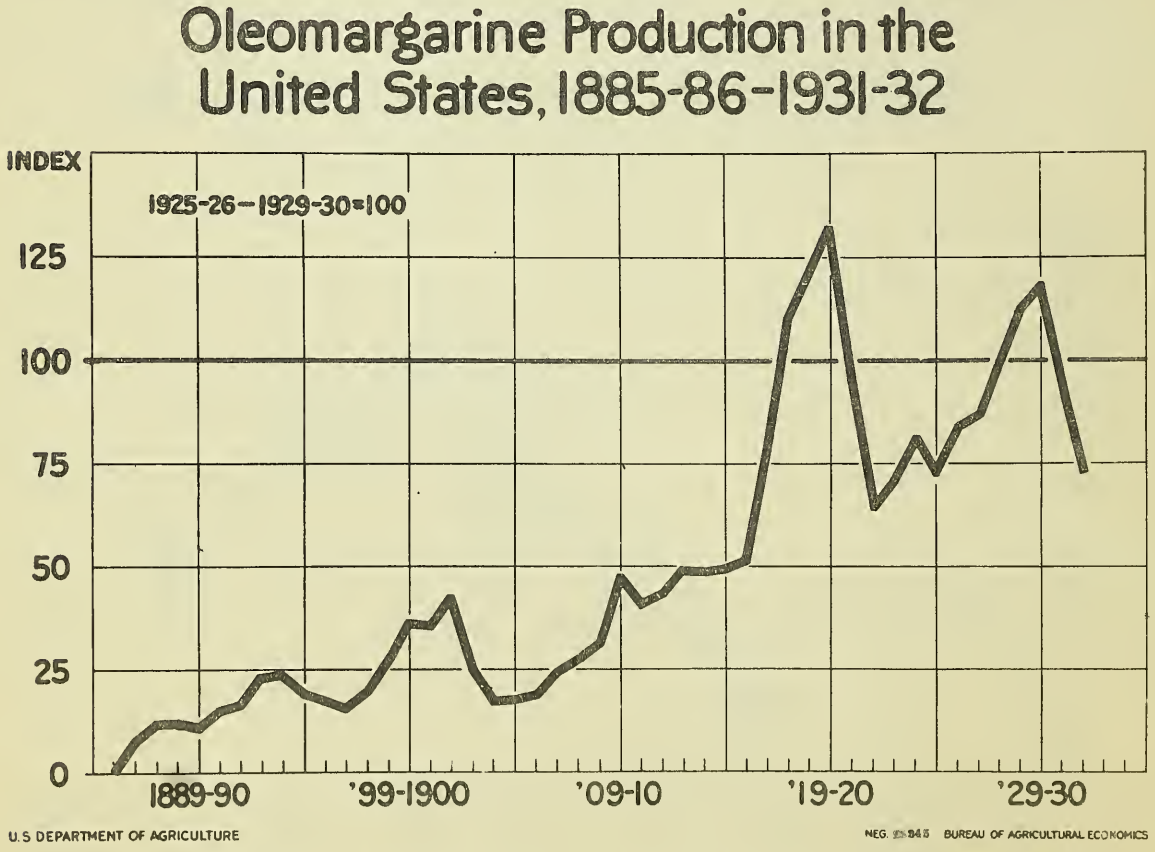

FIGURE 4 - OLEOMARGARINE PRODUCTION FLUCTUATES VIOLENTLY FROM YEAR TO YEAR. PRODUCTION INCREASED RAPIDLY DURING THE WAR PERIOD. PRODUCTION WAS HIGH IN 1929-1930, BUT DECLINED SHARPLY IN 1930-31 AND 1931-32.

4 years, 1877 to 1880 in which exports of butter amounted to more than 3 percent of production. The foreign market has never been an important outlet for American butter.

Grain and Butterfat Prices

Total butter production and per capita production declined during the war period and rose rapidly from 1918 to 1923. These changes were due in large part to changes in the relationship between feed grain prices and butterfat prices. In the period 1910 to 1914 the average price of a pound of butterfat was equivalent in price to 22 pounds of feed grains. In the war period prices of grains rose more than butterfat. Even though butterfat prices were high, they were not high compared with grain. This tended to check butter production.

In the post-war deflation, prices of grain declined more than butterfat prices, and a pound of butterfat in the period 1922 to 1926 was equivalent in price to about 30 pounds of grain. This was an increase of about 35 percent in the price of butterfat as compared with grains above the 1910 to 1914 average. High prices of butterfat compared with grains stimulated production.

In 1933, however, grain prices rose more than butterfat prices and on August 15 1 pound of butterfat was equivalent in price to only 20 pounds of grain, this was the lowest since February 1925, and somewhat lower than the pre-war period. (Fig. 3). The present relationship between butterfat and grain prices if continued for a relatively long period of time will tend to check butter production.

Oleomargarine Production

In addition to these changes in butter production it is interesting to notice the changes in production of butter substitutes. The most rapid rate of increase in margarine production occurred in the decade 1910 to 1919. Production increased at the rate 13 percent per year, and per capita consumption at the rate of 12 percent per year. In the period 1924 to 1932 per capita consumption increased at about 1 percent per year. During the depression of the last 3 years, however, there was a sharp decline in production and consumption. (Figs. 4 and 5).

Table 2.-Annual rate of change in production and per capita consumption of oleomargarine in the United States, 1890-1889 and 1924-1932

Period	Annual rates of change	
	Oleomargarine production	Per capita consumption
	Percent	Percent
1890-1899	+ 5.32	+ 2.75
1900-1909	- 4.54	- 6.92
1910-1919	+ 13.31	+ 11.78
1920-1929	- .01	- 1.09
1924-1932	+ 2.30	+ 1.12

The marked decline in butter prices since 1929 has not been due to increased production of oleomargarine.

Butter Production per Cow

About 43 percent of the milk produced in the United States in the period 1929 to 1931 was used in making butter, including both farm and factory. Somewhat more than half of the milk was used as fluid milk and cream, for the production of other manufactured products, and for feeding calves. Total butter production per milk cow in the United States averaged about 95 pounds per year.

From 1900 to 1918 total butter production per milk cow in the United States declined. Butter production per cow was low in the war period. Since 1924 there has been relatively little change in butter production per cow. (Fig. 6).

There are many reports as to the decreases in the consumption of fluid milk and cream in cities and in the consumption of ice cream. Even though these changes have occurred, there has not been an increase in either total butter production or creamery butter production per cow in the last 5 years. In the last few years milk production per cow has decreased, and there has probably been an increase in the consumption of milk and cream on farms. These changes have tended to offset the decreases in city consumption, so that butter production per cow has shown little change. The marked decline in the price of butter since 1929 has not been due to any marked change in production per cow.

Butter Production by Months

Let us turn for a moment and consider the changes in the seasonal distribution of butter production. In the 7-year period 1926 to 1932 creamery butter production in the United States increased at the rate of 2.72 percent per year. There was a wide variation in the rate of increase in production by months. December production increased at the rate of 6.35 percent per year while there was practically no change in July production

Production in the summer months June to September, increased at a less rapid rate than the total for the year. In the months October to May, production increased more rapidly than the yearly total. In the period 1926 to 1932 butter production in the fall, winter, and early spring months has increased more rapidly than production during the summer months. There are several factors that probably account for this shift in seasonal production. Reports received by the Bureau of Agricultural Economics indicate that there has been some shift toward more fall freshening.

During the 3 years, 1930, 1931 and 1932, there have been widespread droughts and pastures were poor. Poor pastures tended to curtail production during the summer months. In the past 7 years prices of butterfat have been high in relation to feed grains especially during the winter months, this has also probably tended to stimulate winter production.

Table 3.-Annual rate of change in creamery butter production, by months, 1926 - 1932

Month	Rate of change Percentage ~~of production~~
	Percent
Jan.	4.33
Feb.	4.33
Mar.	2.97
Apr.	3.16
May	3.15
June	1.08
July	- .15
Aug.	.70
Sept.	1.49
Oct.	3.80
Nov.	5.23
Dec.	6.35
Total	+ 2.72

Butter Production by Sections

In addition to these differences in the rate of change in creamery butter production by months, there have also been marked differences in the trend of creamery butter production in the various sections of the country.

In the 7-year period 1926 to 1932 creamery butter production in the North Atlantic States decreased at the rate of 7.10 percent per year. This was the only section of the country in which the trend of production was downward.

In the East North Central States (exclusive of Wisconsin) production increased at the rate of 1.98 percent per year. In the leading creamery butter states (Minnesota, Iowa, and Wisconsin) production increased at the rate of 2.47 percent per year. In the Pacific Coast States production increased at the rate of 2.19 percent per year. For the United States as a whole, creamery butter production increased at the rate of 2.72 percent per year. Thus in those sections which are generally considered the most intensive dai sections, the North Atlantic States, East North Central States and the leading creamery butter section (Minnesota, Iowa, and Wisconsin) butter production increased at a less rapid rate than for the country as a whole.

It was in the Western Corn Belt States, the Mountain States, and the Southern States that creamery butter production increased most rapidly in th past 7 years.

Indiana was the only one of the important dairy states east of the Mississippi River in which creamery butter production increased at a more rapid rate than for the country as a whole.

The leading fluid milk markets are in the North Atlantic and East North Central States. During the last 7 years creamery butter production in the states that have the more important fluid milk markets has not increased as rapidly as in other sections of the country. The fluid milk prices in these important fluid areas have not stimulated production as compared with other sections of the country. During the past 7 years butter pr duction increased most rapidly in the states west of the Mississippi River.

Table 4.- Annual rates of change in creamery butter production, 1926 - 1932

Section or State 1/	Creamery butter production in 1932 percentage of total	Annual rates of change in production 1926-1932
	Percent	Percent
United States	100.00	2.72
North Atlantic States	1.47	- 7.10
East North Central States (excluding Wis.)	18.04	1.98
Creamery butter States (Minn., Iowa, and Wis.)	39.64	2.47
Western Corn Belt States (Nebr., Kans., N. Dak., S. Dak., and Mo.)	19.54	3.54
Pacific Coast States	8.14	2.19
Mountain States	5.01	3.88
South Central States	7.36	6.85
South Atlantic States	.79	3.09
Ohio	4.79	0.56
Mich.	4.64	1.66
Ind.	4.46	3.84
Ill.	4.16	2.26
Wis.	10.06	2.51
Minn.	16.23	0.90
Iowa	12.96	4.66
Mo.	4.82	4.28
N. Dak.	2.91	8.32
S. Dak.	2.34	5.31
Nebr.	5.06	- 1.73
Kans.	4.40	6.75
Ore.	1.71	5.57
Wash.	2.10	4.32
Calif.	4.33	0.17
Idaho	1.69	7.98
Colo.	1.30	2.45
Tex.	2.06	11.75
Okla.	2.08	8.04
Ky.	1.17	0.83

1/ In none of the other States was 1932 production more than 1 percent of the total.

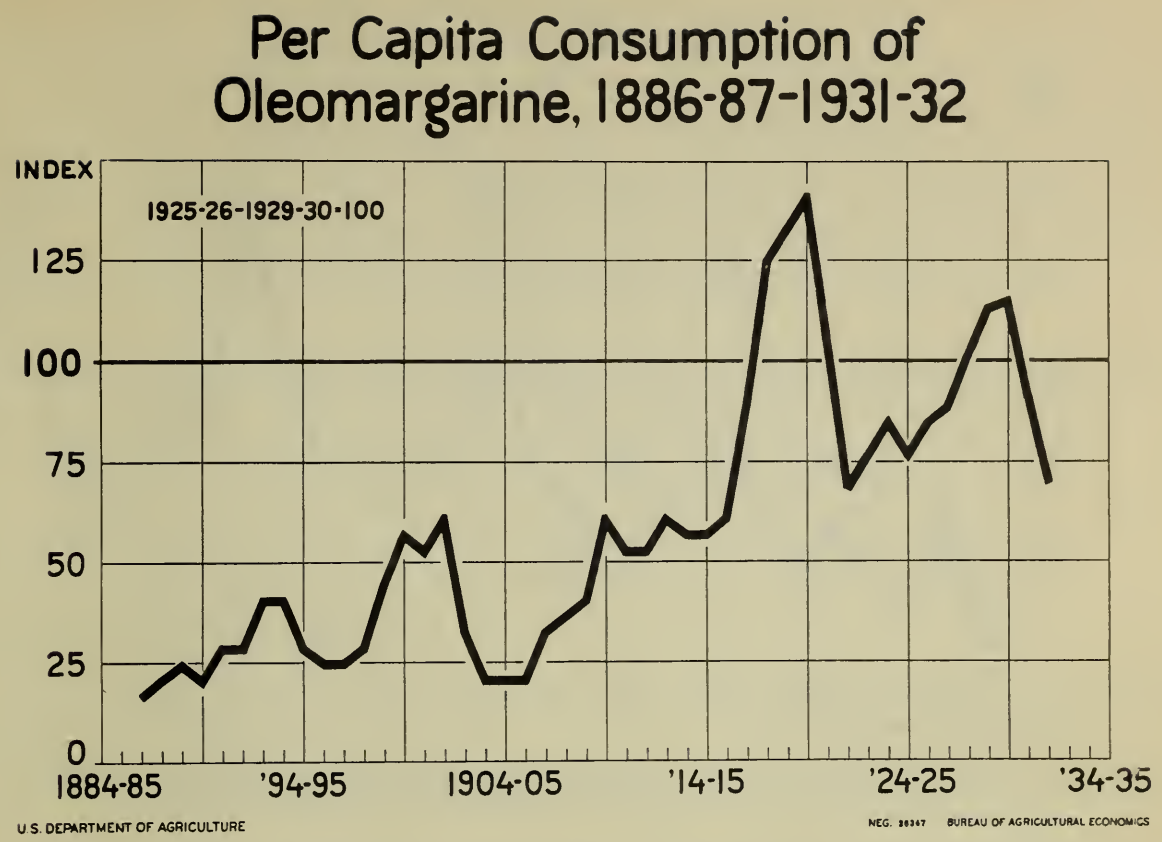

FIGURE 5 - PER CAPITA CONSUMPTION OF OLEOMARGARINE WAS HIGH IN THE WAR PERIOD. IN 1931-32 PER CAPITA CONSUMPTION WAS THE LOWEST SINCE 1922.

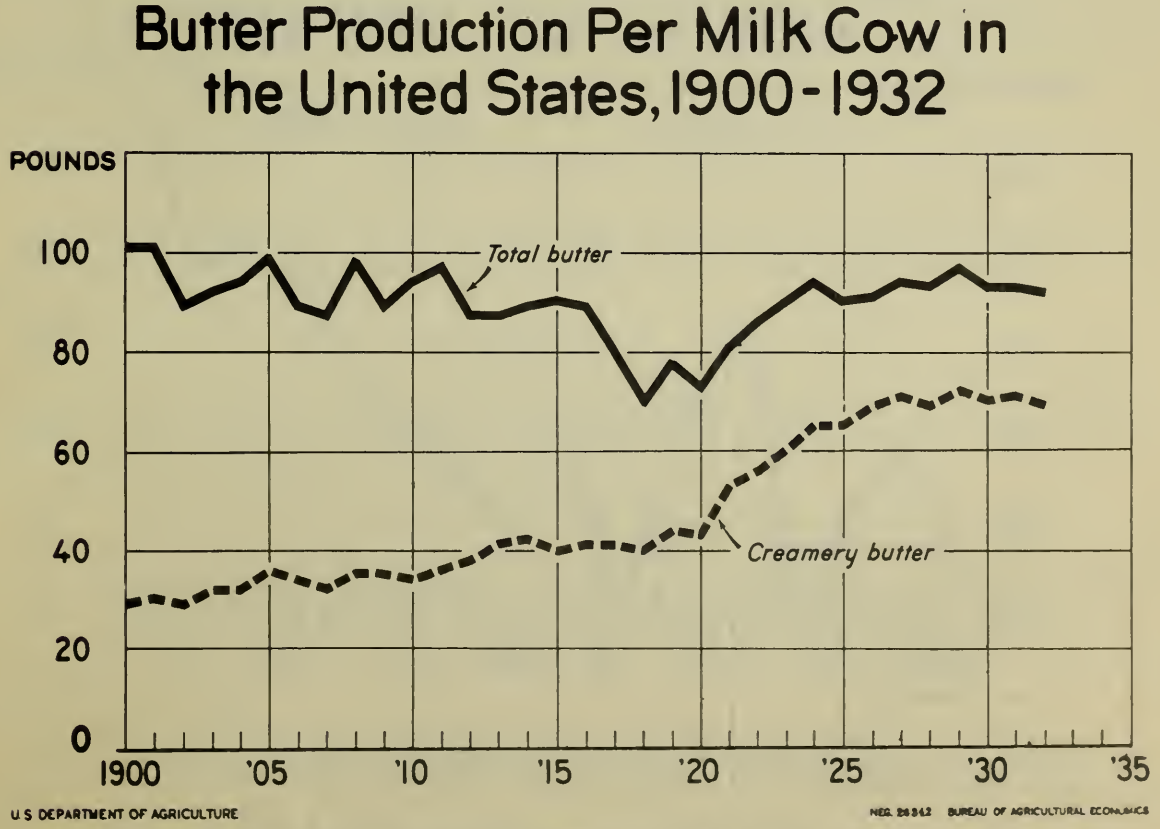

FIGURE 6 - FROM 1900 TO 1918 BUTTER PRODUCTION PER MILK COW DECLINED. IN THE LAST SEVEN YEARS, HOWEVER, THERE HAS BEEN RELATIVELY LITTLE CHANGE IN BUTTER PRODUCTION PER COW.

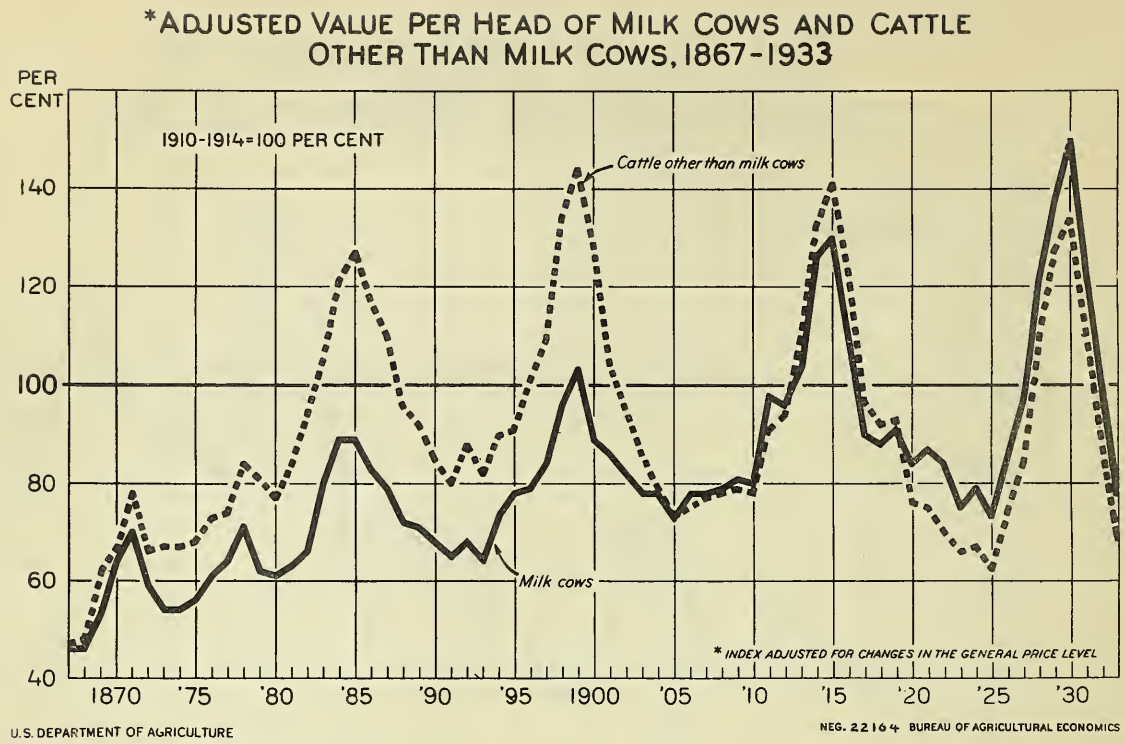

FIGURE 7 - PEAKS IN THE PRICES OF MILK COWS AND ALL CATTLE OCCUR EVERY 14 TO 16 YEARS. ON JANUARY 1, 1933 THE PRICE OF MILK COWS PER HEAD IN RELATION TO OTHER PRICES WAS NEARLY AS LOW AS IN THE LOW POINTS OF THE TWO PRECEDING CYCLES.

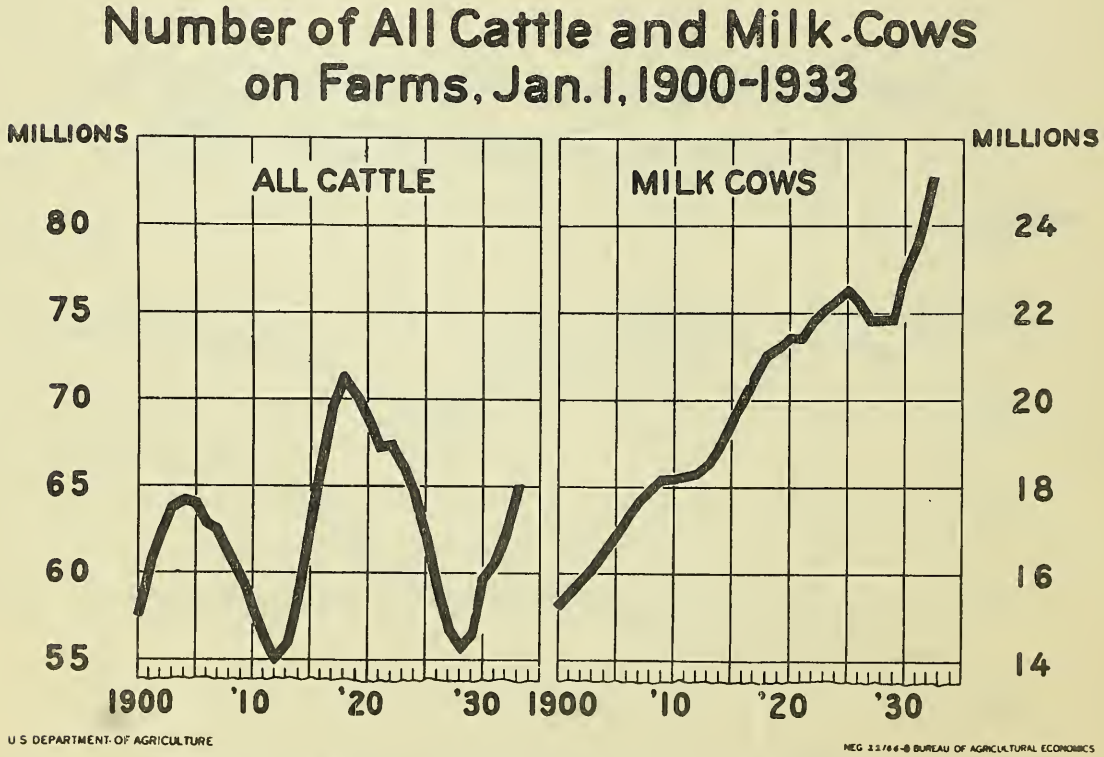

FIGURE 8 - THERE HAS BEEN A MARKED UPWARD TREND IN THE NUMBER OF MILK COWS. THERE IS A DISTINCT CYCLE IN THE NUMBER OF ALL CATTLE ON FARMS. NUMBERS OF MILK COWS AND ALL CATTLE HAVE INCREASED RAPIDLY IN THE PAST FIVE YEARS.

Cattle Cycle

An important factor affecting the dairy situation is the cycle in prices of milk cows. There are alternate periods of high and low cow prices. The peaks in prices have occurred every 14 to 16 years. The last peak came in 1929. (Fig. 7). When prices of cows are increasing farmers raise too many heifers. When prices are low they raise too few. In the periods of low prices the number of all cattle on farms has decreased, and the increase in milk cow number has been checked. This happened in the period 1909 to 1912 and in the period 1925 to 1927. (Fig. 8).

In the past 3 years the purchasing power of milk cow prices declined 48 percent. This decline was greater than the decline from the peak to the low points of the preceding cycles. There has been some adjustment to this decline on the part of farmers. The raising of heifer calves has been checked. The number of heifers per 100 cows on the first of the year declined from 20.5 on January 1, 1930 to 18.5 on January 1, 1933. The number of heifers on farms is probably large enough to maintain numbers with normal rates of culling.

In 1931 and 1932 prices of canner cows were unusually low, butterfat prices were low, but relatively high as compared with grains, and there was a tendency for farmers to reduce culling. A large part of the increase in milk cow numbers in the last 2 years was due to the low rate of culling. (Fig. 9).

In the last 3 months there have been some indications that the rate of culling has increased. In May, June, and July the number of cows and heifers slaughtered under Federal inspection averaged nearly 30 percent larger than in 1932, and for the first 7 months of the year was 15 percent greater than in 1932. (Fig. 10). This increase in culling will check the rapid increase in milk cow numbers, and will tend to reduce production.

World Exports of Butter

In addition to the shifts in production in the United States, there have been some striking changes in production in the principal butter exporting countries.

In the period 1925 to 1931 creamery butter production in the United States increased at the rate of 3.72 percent per year. World exports of butter however, increased at the rate 5.98 percent per year, that is, much more rapidly than United States production.

The changes in world exports of butter are somewhat the same as the change in United States production. World exports increased more rapidly during the 1880's and 1890's than during the pre-war period 1893-1914. Exports declined during the war period and then increased rapidly during the post-war period.

Butter exports from the Southern Hemisphere countries, primarily New Zealand and Australia have increased much more rapidly than from the Northern Hemisphere countries. (Figs. 11 and 12).

Table 4.- Annual rates of change in butter production in the United States, and in world exports of butter, 1885-1931

Item	1885-1897	1898-1914	1925-1931
	Percent	Percent	Percent
Butter production United States.	+ 3.69	+ 0.88	+1.37
Butter exports, world 1/	+ 4.39	+ 2.55	+5.98
Northern Hemisphere 1/	+ 3.49	+ 1.91	+4.08
Southern Hemisphere 1/	+10.00	+ 5.96	+9.62

1/ From unpublished manuscript "International Trade in Butter and Cheese", by F. R. Tomlinson.

The recent trends in butter production can be summarized as follows:
(1) During the past 9 years butter production has increased at about the same rate as population, and per capita production has not changed.
(2) Per capita production of butter in the United States reached a peak in the late 90's, and has since declined.
(3) Per capita production of butter in the last 5 years was the same as in the pre-war period and except for the war years was as low as at any time in this century.
(4) In the past 9 years there has been relatively little change in butter production per cow.
(5) The low prices of butter at the present time cannot be explained by the high production per capita or any marked changes in production.
(6) Creamery butter production has increased more rapidly in the winter and early spring months, than in the summer months.
(7) Creamery butter production has increased most rapidly in the States west of the Mississippi River. The increases in butter production in the fluid milk States have been small compared with those in other sections.
(8) Exports of butter from foreign countries have increased much more rapidly than United States production.

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Number of Dairy Heifers 1 to 2 Years Old Per 100 Cows January 1, and Number of Cows Eliminated from Dairy Herds Per 100 Cows

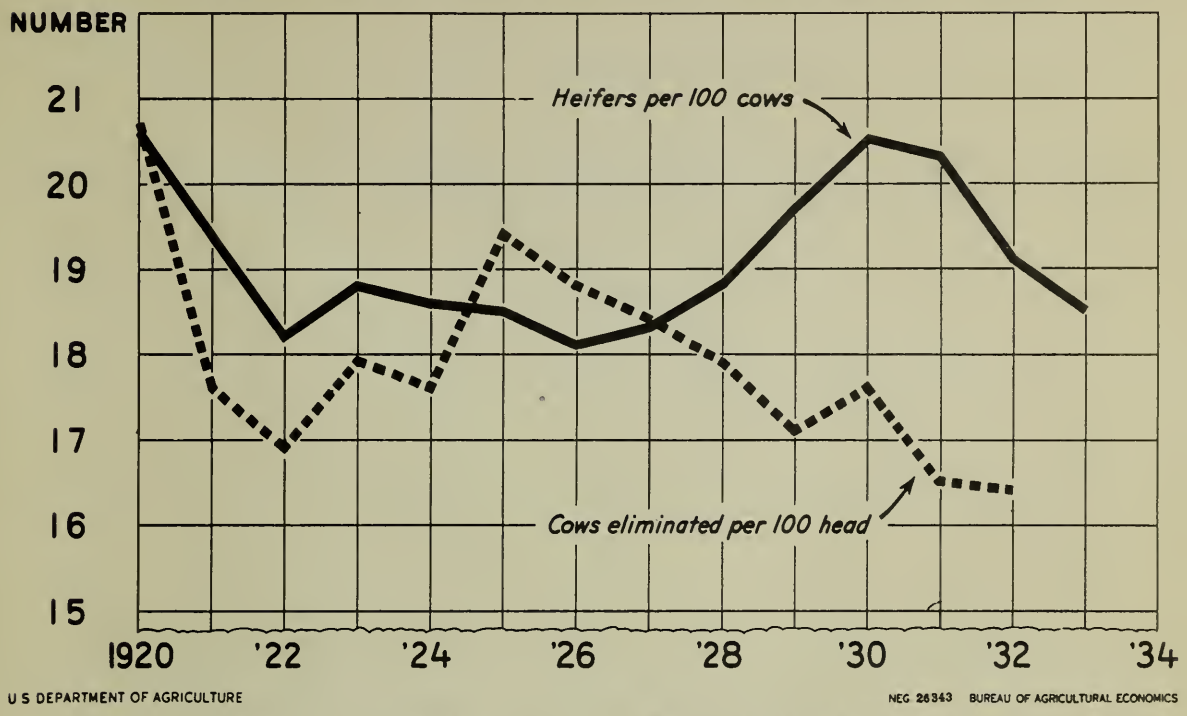

FIGURE 9 - NUMBERS OF HEIFERS PER 100 MILK COWS INCREASED RAPIOLY FROM 1926 TO 1930, BUT HAS OECLINEO IN THE LAST THREE YEARS. THE NUMBER OF COWS ELIMINATEO FROM DAIRY HERDS PER 100 HEAO HAS DECLINED SINCE 1925. IN 1931 ANO 1932 THE RATE OF CULLING WAS LOW.

COWS AND HEIFERS SLAUGHTERED UNDER FEDERAL INSPECTION

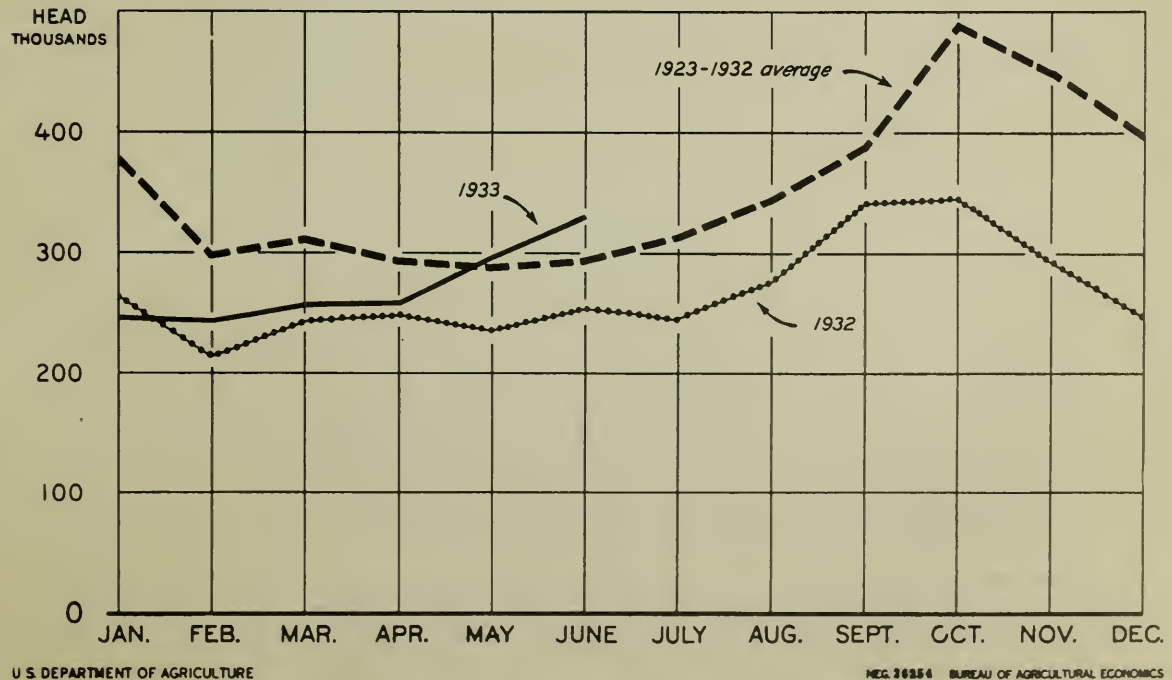

FIGURE 10 - THE NUMBER OF COWS AND HEIFERS SLAUGHTERED UNOER FEOERAL INSPECTION WAS LOW IN 1932. IN MAY, JUNE, AND JULY 1933, HOWEVER, SLAUGHTER WAS ABOUT 30 PERCENT LARGER THAN IN THE SAME MONTHS OF 1932. THIS PROBABLY INOICATES AN INCREASE IN CULLING FROM OAIRY HERDS.

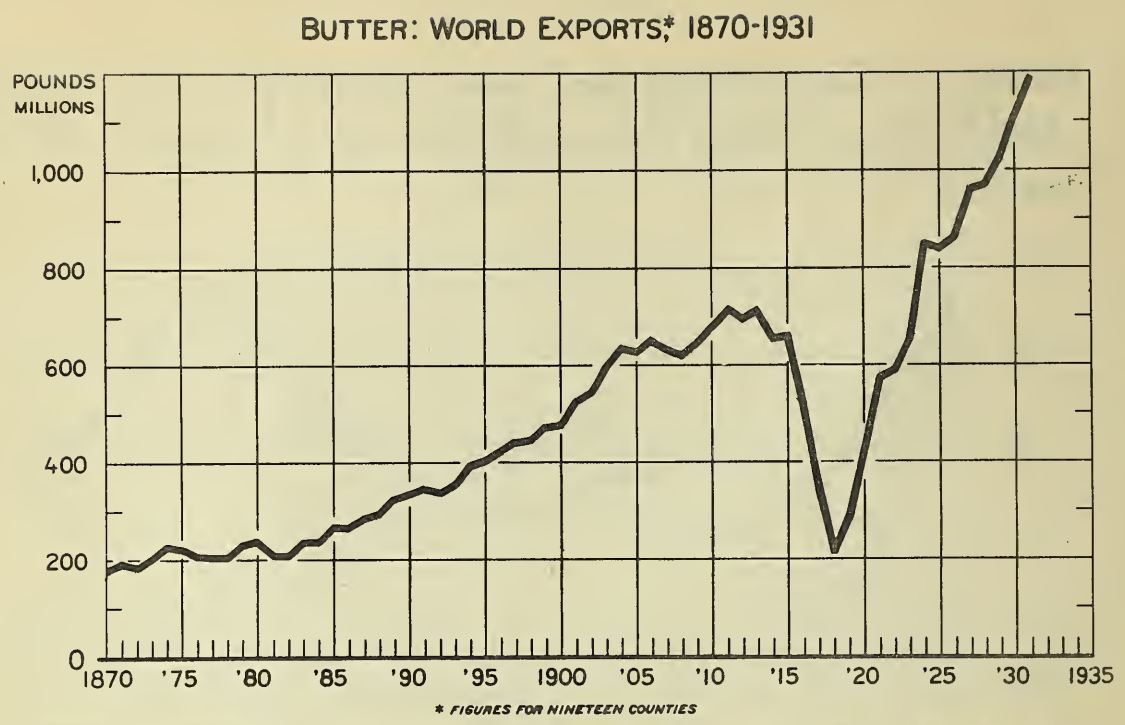

FIGURE 11 - FROM 1898 TO 1914 WORLD EXPORTS OF BUTTER INCREASED AT THE RATE OF 2.55 PERCENT PER YEAR. EXPORTS DECLINED IN THE WAR PERIOD, BUT INCREASED SHARPLY DURING THE POST-WAR PERIOD.

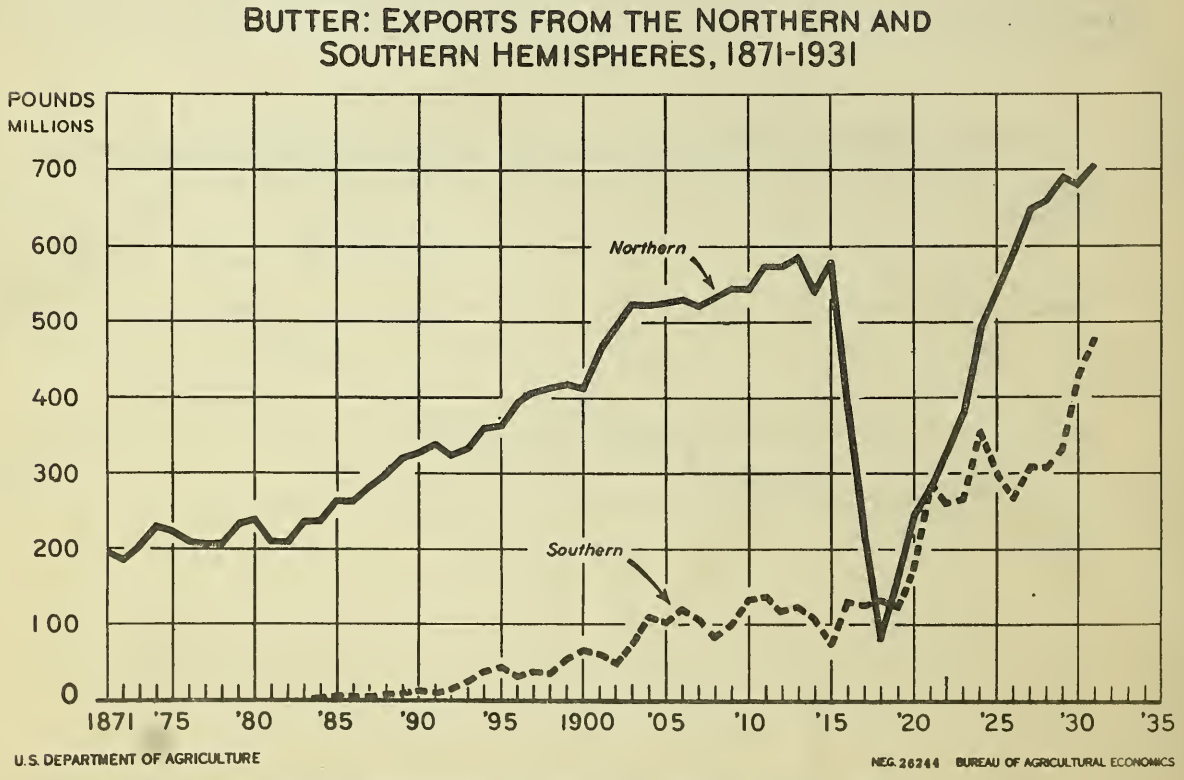

FIGURE 12 - BUTTER EXPORTS FROM SOUTHERN HEMISPHERE COUNTRIES HAVE INCREASED MORE RAPIDLY THAN FROM NORTHERN HEMISPHERE COUNTRIES.